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ABSTRACT

This second in a series of eight modules for a course titled Quality Assurance Practices describes the quality assurance requirements for the qualification of suppliers, for evaluating subsequent supplier performance, and for accepting items or services furnished by the supplier. The module follows a typical format that includes the following sections: (1) introduction, (2) module prerequisites, (3) objectives, (4) notes to instructor/student, (5) subject matter, (6) materials needed, (7) procedures, (8) data table, (9) reference materials, (10) test. (The course is one of fifteen technical courses for the second year of a two-year postsecondary curriculum in Nuclear Quality Assurnace/Quality Control Technology.) (LRA)

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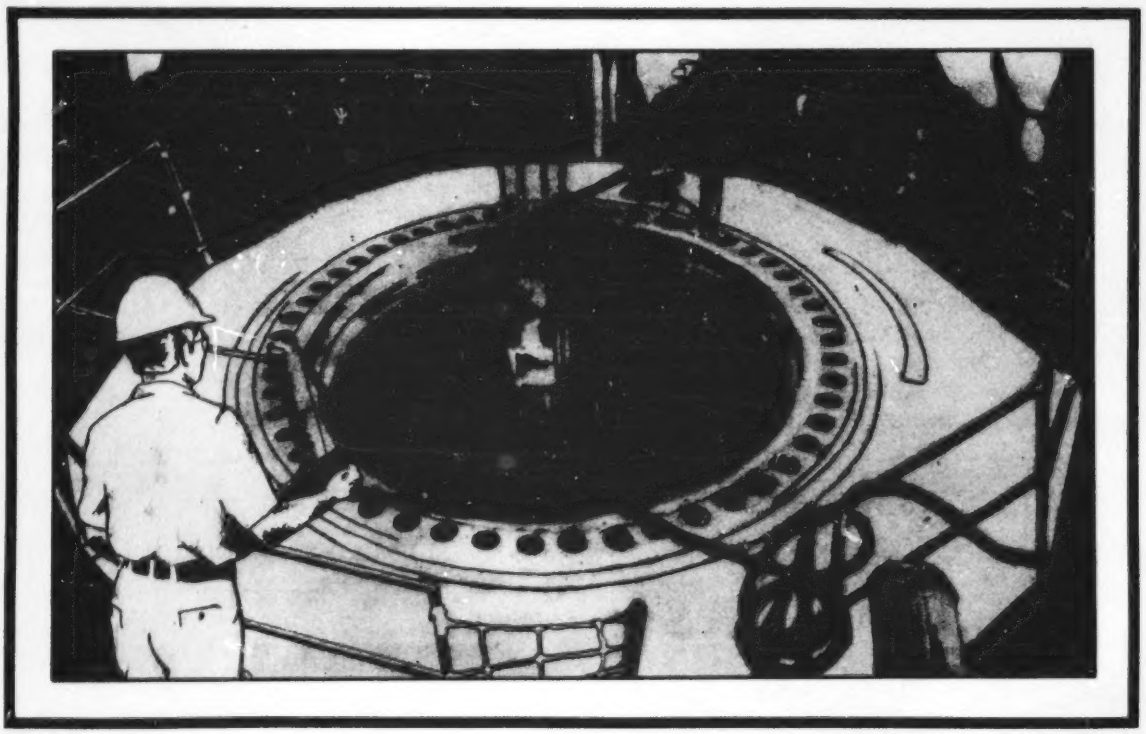
NUCLEAR TECHNOLOGY

COURSE 31 QUALITY ASSURANCE PRACTICES

MODULE 31-2 Vendor Qualification

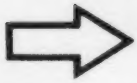


CE 024 286

GENERAL PHYSICS CORPORATION
Columbia , Maryland

COURSE MODULES

COURSE 31 QUALITY ASSURANCE PRACTICES



Module 31-1	Overall Quality Assurance Program
Module 31-2	Vendor Qualification
Module 31-3	Receiving Inspection
Module 31-4	Identification, Storage and Handling of Components, Parts and Materials
Module 31-5	Non-Conforming Materials
Module 31-6	Certification and Qualification of Quality Control Inspectors
Module 31-7	Auditing for Quality Assurance
Module 31-8	Document Handling, Storage and Retrieval for Quality Assurance

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This module was prepared for General Physics Corporation by John Espy, General Physics Corporation.

GENERAL PHYSICS CORPORATION

1979

INTRODUCTION

The Nuclear QA/QC Technician performs reviews, inspections, and surveys for the purpose of assisting in the evaluation of suppliers. These tasks may support initial evaluation of suppliers to determine those who are to be considered as "qualified" suppliers. Or, these tasks may support evaluation of the performance of suppliers who have been awarded contracts for items or services. In performing these tasks, the Nuclear QA/QC Technician must be familiar with and apply the procurement policies used by his or her employer.

This module describes the quality assurance requirements for the qualification of suppliers, for evaluating subsequent supplier performance, and for accepting items or services furnished by the supplier. These areas are described by two major divisions: preaward activities and postaward activities.

The module describes the preaward activities of (1) selection of procurement sources and (2) bid evaluation and award. It is the first activity which "qualifies" suppliers. The second activity solicits bids from qualified suppliers and awards the contract to the successful bidder.

The module describes the postaward activities of (1) purchaser evaluation of supplier performance, (2) purchaser verification of items or services furnished by the supplier, (3) control of nonconformances, (4) corrective action, (5) purchaser's acceptance of items and services, (6) quality assurance records and (7) audits. Most attention is devoted to items (1), (2) and (5) because other modules of Course 31, Quality Assurance Practices, describe quality assurance programs applicable to the other items.

MODULE PREREQUISITES

The student shall have completed Module 31-1.

OBJECTIVES

Upon completion of this module, the student/trainee can:

1. Define:
   a. purchaser
   b. supplier
   c. designated representative
   d. procurement document
   e. right of access
2. State the purpose of the purchaser's program for the selection of procurement sources.
3. Briefly describe the purchaser's program for the selection of procurement sources including the methods of (a) quality history, (b) current quality information, and (c) on-site review.
4. State the purpose of a bidders list and describe its content and use.
5. Describe what constitutes a solicitation for bid.
6. State the purpose of bid evaluation applicable to (a) technical considerations, (b) quality assurance, (c) supplier personnel, (d) supplier production capacity, and (e) exceptions.
7. State the overall purpose of the Purchaser's postaward activities.
8. Name four activities of the Purchaser used for evaluating supplier performance and describe the role of each.
9. State the purpose of notification points and describe how they are established.

10. Name five elements of the Purchaser's verification activities and describe the role of each.

11. Name four methods of Purchaser's acceptance of items or services furnished by suppliers and briefly describe how each is accomplished.

SUBJECT MATTER

PREAWARD ACTIVITIES

Definitions

Unique terms used in this module are defined as follows:

- Designated Representative - An individual or organization authorized by the Purchaser to perform functions in the procurement process.
- Procurement Document - Purchase requisitions, purchase orders, drawings, contracts, specifications or instructions used to define requirements for purchase.
- Purchaser - The organization responsible for establishment of procurement requirements and for issuance, administration, or both, of procurement documents.
- Quality Assurance Program Requirements - Those individual requirements listed in ANSI N45.2 which when invoked in total or in part establish the requirements of a quality assurance program.
- Quality Assurance Records - Those records which furnish documentary evidence of the quality of items and of activities affecting quality.
- Right of Access - The right of a Purchaser or designated representative to enter the premises of a Supplier for the purpose of inspection, surveillance, or quality assurance audit.
- Services - The performance by a Supplier of activities such as design, fabrication, inspection, nondestructive examination, repair, or installation.
- Subtier Procurement - Procurement by a Supplier from a subsupplier of items or services.
- Supplier - Any individual or organization who furnishes items or services to a procurement document.

It includes the terms Vendor, Seller, Contractor, Subcontractor, Fabricator, Consultant, and subtier levels.

- Surveillance - The physical presence to monitor by observation the designated activities to assure that they are performed in a specified manner.

Types of Preaward Activities

Preaward activities are those measures taken by a Purchaser which result in placement of a contract with a supplier. These measures are intended to ensure that contracts are placed with those suppliers who demonstrate the ability to successfully fulfill the contract. Preaward activities consist of activities associated with (1) selection of procurement sources and (2) bid evaluation and award.

The preaward activities associated with selection of procurement sources result in "qualifying" prospective suppliers. The qualification is not a certified qualification resulting from qualification testing which one might normally associate with the qualification. Instead, qualified suppliers are those who are considered by the Purchaser as capable of satisfactorily providing products or services. The Purchaser determines the criteria by which suppliers are considered qualified.

The preaward activities associated with bid evaluation and award result in placing a contract with the successful bidder. Again, the Purchaser determines the specific measures for evaluating each bid and determining which supplier will receive the contract award. The Purchaser awards the contract based on determination of the supplier whose bid and capabilities best fulfill the requirements of procurement documents at an acceptable cost.

Preaward activities are illustrated by Figure 31-2-1.

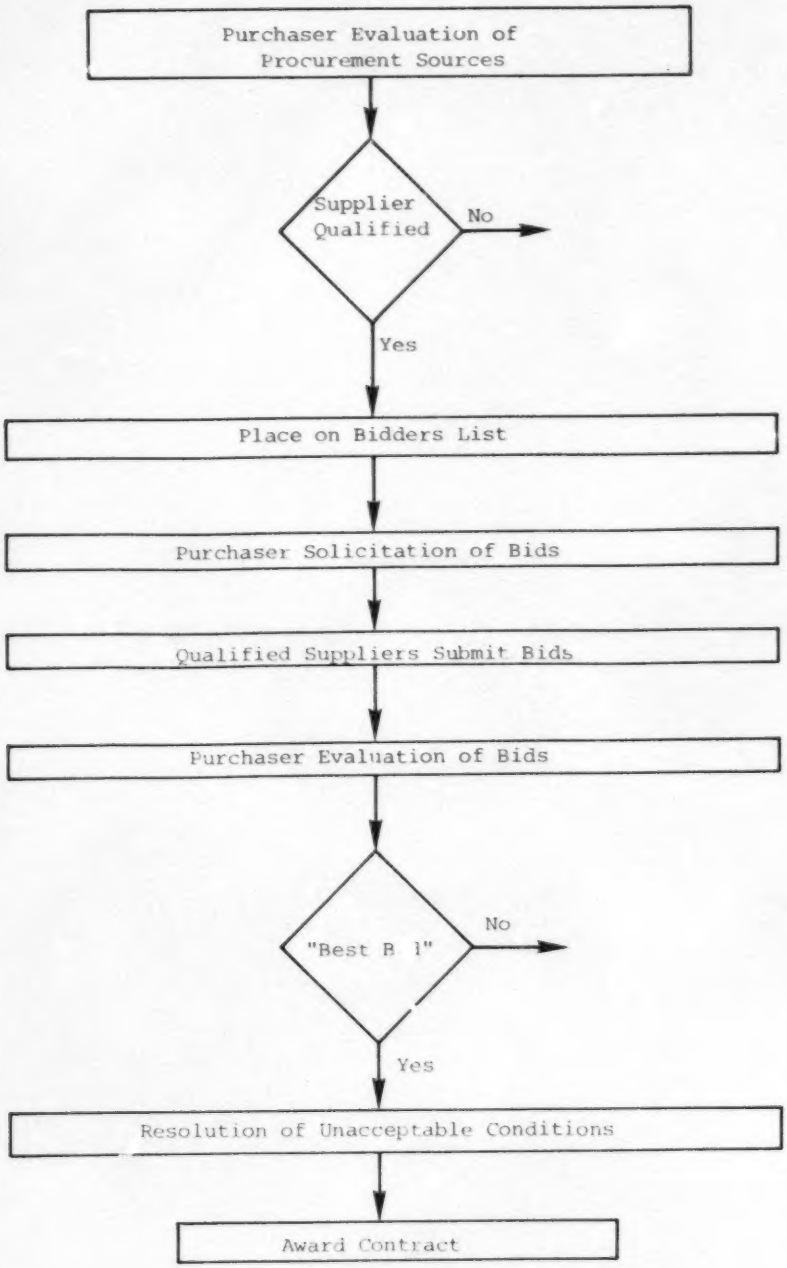

Figure 31-2-1. Preaward Activities

SELECTION OF PROCUREMENT SOURCES

Purpose of Selection

The owner of the nuclear power plant, and all tiers of subcontractors and suppliers from the owner, purchase necessary materials, components, and services which are not available within their own internal resources of a given company. Each such purchaser has a vital interest in obtaining products and services which fully comply with requirements of procurement documents. This interest is threefold. The purchaser desires (1) economy, (2) compliance with schedule, and (3) quality products and services. Thus, selection of suppliers for potential use predetermines those suppliers who are deemed by the purchaser as having the capability to furnish quality products or services on time at competitive prices. The results of the predetermination typically are documented in the form of a "bidders list".

Bidders List

Each purchaser maintains a bidders or qualified vendor list which lists those suppliers considered by the purchaser as a qualified supplier. The process of supplier selection results in decisions to add or not add suppliers to the bidders list. Whenever a need arises to proceed with a procurement, the bidders list provides a convenient listing of qualified suppliers from whom bids may be solicited.

Suppliers are categorized on bidders lists by products and services for which each is considered qualified. Such categorization provides for quick identification of suppliers considered qualified for a given product or service. Examples of categories include:

- Design and Engineering (i.e., nuclear, civil, electrical, mechanical, analyses)

- Code components (i.e., pressure vessels, pumps, valves, piping, storage tanks, and heat exchangers)
- Electrical components (i.e., generators. motors, switchgear, controllers, relays, and instrumentation)
- Processes (i.e., welding, heat treating, plating, destructive testing, and nondestructive testing)

Selection Process

Selection of suppliers is based on evaluation of their capability to provide items or services in accordance with the requirements of the procurement documents. Purchasers establish within their quality assurance program internal responsibilities for determining supplier capability. More than one department may have defined responsibilities for such determination. For example, Purchasing Department may be responsible for determining financial stability of suppliers, Engineering Department may be responsible for determining adequacy of the supplier's facilities, equipment, processing, and technical expertise, and Quality Assurance Department may be responsible for determining the adequacy of the supplier's quality assurance program.

Purchasers describe within their quality assurance program the methods for evaluating supplier capability and the results therefrom. Methods used for evaluation include any or all of (1) evaluation of historical records of performance on same or similar products and services, (2) evaluation of current quality information furnished by the supplier, and (3) evaluation of the supplier's capabilities by on-site reviews.

Evaluation of historical records of performance to determine a supplier's capability examines history of the supplier with the purchaser or with other purchasers. The evaluation determines if the supplier has furnished the same or similar product or service in a generally satis-

factory manner. Recent experience with the supplier is of most concern. While "recent" has various significance, experience within the past year or two is of most concern. Objective evidence of recent supplier experience is provided by (1) records of supplier performance on recent contracts, (2) performance of supplier's product in service, or (3) experience reported by other users of the supplier's product or service.

Evaluation of current quality information furnished by the supplier to determine the supplier's capabilities involves a request to the supplier to furnish necessary information. Preplanned questionnaires are often used for this purpose. The questionnaire requires a senior management official of the supplier to certify that the information furnished is complete and accurate. Questionnaires typically require information as follows·

- manufacturing capabilities including number and type of machines and reserve capacity.
- processing capabilities such as welding, heat treatment, cleaning, plating, and painting.
- test capabilities including functional testing, destructive testing, and nondestructive testing.
- codes, standards, and specifications previously complied with
- quality assurance program including submittal of the QA Manual and QA Procedures.
- personnel resources
- other purchasers who have received same or similar products or services.

Evaluation of supplier's capabilities by on-site review involves a visit by the Purchaser to directly examine the supplier's capabilities. The Purchaser may send a team comprized of a representative of engineering, purchasing, and quality assurance departments. These visits evaluate

the same types of information as requested by preplanned questionnaires.

One can sense that the three methods of evaluation may result in three "levels of confidence" in the supplier's capabilities. While this may be true, one can argue that satisfactory service of product (first method) is more reliable than on-site evaluations (third method). One could also argue that on-site evaluation is best because it directly views present supplier capabilities. On the other hand, supplier certification of capabilities (second method) provides current information and tends to put the supplier's reputation "on the line". The concensus is that each of the three methods have merit and that each Purchaser must use the method, or combination of methods, which convinces that Purchaser of the supplier's capabilities. In general, as complexity of product or services increases, the amount of information obtained on the supplier's capabilities increases.

BID EVALUATION AND AWARD

Solicitation for Bids

At the time of need to contract for product or services, the Purchaser solicits bids from prospective suppliers. With certain exceptions, the solicitation for bids is a formal process. The Purchaser assembles the procurement documents which specify the desired product or service to be purchased and all technical, quality, and contractual provisions which will apply to the successful bidder. The assembled procurement "package" is issued to prospective suppliers who have been previously determined to be qualified for the scope of work to be contracted. Prospective suppliers are obtained from an established bidders list, or if a bidders list has not been maintained, the selection

process is pressed into service to establish a listing of qualified suppliers.

Formal solicitations for bids are unnecessary in certain instances. One category where this is true is "catalog product". Catalog product refers to standardized product designs offered routinely by suppliers. If the Purchaser determines that the standard product suffices, the solicitation process may simply be telephone calls to qualified suppliers to determine price and delivery date. Another category is consulting services. The Purchaser may not have the time or experience to prepare procurement documents which delineate the full extent of consulting services desired. Qualified consultants are requested to submit bids which detail the consultant's services proposed to meet the Purchaser's needs. The submittal by the successful consultant then becomes part of the procurement documents. The first submittal is often altered by negotiation before the order is placed.

A unique condition exists if only one supplier is qualified to bid. Such conditions are termed "sole source" and are generally undesirable from the Purchaser's viewpoint. If a sole source situation exists, only the qualified supplier is requested to bid In such cases, Purchasers encourage other suppliers to become qualified for the product or service involved.

Bid Evaluation and Award

The Purchaser establishes methods and assigns internal responsibilities for evaluating bids received. Evaluation of bids has the objective of selecting the supplier whose bid most fully complies with requirements of the procurement documents and offers a reasonable price. Evaluation of bids is made by professional judgement and it may or may not include a numerical ranking system. Numerical ranking systems, when used, consist of predetermined

ranges of numerical values which are credited to each bid in proportion to the excellence of the bid. For example, a 100 point system might permit allocation of 0-30 points for technical, 0-30 points for quality, 0-20 points for schedule, and 0-20 points for a cost-effectiveness ratio such as the quotient of cost divided by the sum of the other points. Whether the evaluation involves numerical ranking or not, the evaluation assesses (1) technical considerations (2) quality assurance, (3) research and development effort, (4) supplier's personnel, (5) supplier's production capability, (6) supplier's past performance, (7) alternates, and (8) exceptions. In addition, the Purchaser typically considers other factors such as warranties, proposed terms and conditions, schedule, and costs. Nonetheless. the eight enumerated items are those with largest effects on quality.

Technical considerations involve evaluation of the bidder's proposal in terms of the codes, standards, specifications and drawings applicable to the procurement. The evaluation determines the supplier's (1) understanding of these documents, (2) ability to comply with these documents, (3) previous experience in working to these documents.

Evaluation of bids for quality assurance requirements involve determining if the bidder has established a quality assurance program which satisfies the requirements of the procurement documents. The evaluation determines if (1) the scope and content of the supplier's QA program coincides with that required by the procurement documents, (2) ample vendor planning is identified to ensure accomplishment of required inspections and tests, (3) supplier plans are identified for requiring appropriate QA programs of subcontractors, and (4) Purchaser's right of access is acknowledged by the supplier.

Evaluation of research and development efforts is performed when some portion of the contract requires appli-

cation of technology which is not presently found in production or which is beyond the current "state of the art". Examples of such cases include new designs, design modifications to resolve historical problems, and new analyses of design. In such cases, the evaluation determines the supplier's (1) design capabilities, (2) proof of analytical models, (3) plans for design qualification testing, and (4) access to resource materials.

Evaluation of supplier's personnel determines if required skills are available in sufficient numbers to accomplish the work. Types of skills include design engineering, manufacturing engineering. civil engineering. electrical engineering, quality engineering, craftsman, (e.g., machinists, welders, pipe fitters, electricians, etc.), inspectors (e.g., mechanical, electrical, civil), testers (e.g., functional, destructive, nondestructive), and others (e.g., schedulers, coordinators). In addition, the evaluation determines if personnel are qualified or plans are identified for qualifying personnel where procurement documents require formal qualification of personnel, such as welders and nondestructive testing personnel.

Evaluation of supplier's production capabilities determine if production and processing equipment and facilities are adequate to produce product which complies with procurement documents and whether sufficient reserve processing capacity exists to meet schedular commitments. This evaluation considers each type of processing which will be necessary to produce the product. Examples include metal forming, machining, welding, heat treating, brazing, soldering, wiring, assembly, fitting, cleaning, coating, testing, inspecting, handling, and packaging.
Supplier's plans for subcontracting for such capability are also evaluated.

Evaluation of supplier's past pe. formance may have

been completed in sufficient detail during the process of selection of qualified bidders. Further evaluation of supplier past performance is made as necessary to verify past performance identified in the supplier's bid which has not been previously verified. The evaluation determines if such prior performance was generally satisfactory in terms of procurement documents.

Evaluation of alternates is applicable whenever a supplier proposes alternative products, methods, or services to those required by the procurement documents. The evaluation determines the acceptability of the alternate and advantages to the Purchaser for accepting the alternate. Evaluation of alternates also connotes alternatives available to the Purchaser upon completion of bid evaluation. The Purchaser compares strengths and weaknesses of all bids and considers the impact on the Purchaser caused by each weakness. Such evaluation determines alternative courses of action by the Purchaser to arrive at a procurement award. Examples include requests for rebid, further negotiation with the "best" bidder, and modification of the procurement documents.

Evaluation of exceptions is applicable whenever a supplier takes exception to requirements of the procurement documents. The appropriate representative of each discipline reviews the supplier's basis for each exception, and determines the technical acceptability of allowing such exception on the basis of requirements of the appropriate technical or quality specification.

Unacceptable conditions determined by evaluation of bids are compared for each bidder to commence a process of elimination. The Purchaser may notify bidders of unacceptable conditions and request revised bids. In such case, evaluation of bids in repeated upon receipt of the revised bids. In lieu of requesting revised bids, the Purchaser may select

one supplier as the most successful bidder. In either case, the Purchaser obtains resolution or commitments for resolution of unacceptable conditions prior to awarding the contract to the successful bidder. Such resolution or commitment for resolution is added to the procurement documents package and made part of the contract.

POST-AWARD ACTIVITIES

Purpose

The Purchaser always has the responsibility of determining acceptance of suppliers' products and services. In order to make this determination, the Purchaser plans and implements post-award activities which develop a basis for ultimate acceptance of items or services furnished by the supplier. While the basis for acceptance may be established by a single decision point, more often than not it is the cumulative results of many post-award activities.

Types of Post-Award Activities

The extent of post-award activities is dependent on the uniqueness and complexity of the procurement and on the known performance of the supplier. Frequency of procurement with a given supplier may also influence the extent of post-award activities. In any event, Purchasers plan for the post-award activities to be implemented and adjust these plans as necessary during the life of the procurement in an effort to be able to accept items or services delivered by the supplier. Seven types of activities are considered by the Purchaser's planning as follows:

- Purchaser evaluation of supplier performance.
- Purchaser verification of supplier product and services.
- Control of nonconformances.
- Corrective Action.
- Purchaser's acceptance of items or services.
- Quality assurance records.
- Audits.

PURCHASER EVALUATION OF SUPPLIER PERFORMANCE

Scope

Purchaser evaluation of supplier performance commences at contract award and continues until final delivery of items or services under that contract. However, except for possibly a few very large contracts, it does not require full-time commitment by Purchaser's personnel. The activities for evaluating supplier performance are planned and scheduled as deemed necessary by the Purchaser and consistent with requirements of applicable regulations, codes and standards. These activities include (1) establishment of an understanding of contract provisions, (2) requirements for the supplier to identify planning techniques and processing, (3) review of documents generated by the supplier, (4) identification and processing of change information, and (5) establishment of an exchange of documents method between Purchaser and supplier.

Establishment of Understanding of Contract Provisions

It is in the best interest of the Purchaser to ensure that the supplier understands the provisions of the contract. When suppliers have a complete understanding of contractual provisions at the outset, it is more probable that adequate planning will be made by the supplier without omissions.

The need for actions beyond resolving items resulting from bid evaluation and award is dependent on the complexity of the contract. As a minimum, Purchasers require the supplier to sign and return an acknowledgment copy of the contract. While this serves primarily as a legal binder, it also attests to the supplier's understanding and acceptance of the contract. For more complex contracts, one or more meetings may be held to review contractual pro-

visions and methods of complying with such provisions.

Supplier Identification of Planning and Processing

For complex work, the contractual provisions require the supplier to identify plans for accomplishing the work required by contract and the processing to be used in manufacture, inspection and test activities. Such planning and processing is developed in conjunction with or soon after contract award. The Purchaser evaluates subsequent supplier performance to such planning and processing.

Supplier planning identifies and schedules all major work items necessary for accomplishment of the contractual scope of work. This planning is sometimes termed "contract schedule of events", "milestones", or "master contract schedule". As appropriate to the contract, it identifies and schedules major tasks in the following areas:

- Placement of subtier procurements.
- Preparation of detailed processing instructions.
- Performance of qualifications of procedures and personnel.
- Preparation of drawings, procedures, specifications, and manuals.
- Planning for final inspections and tests.
- Submittal of progress reports.
- Identification of shipment schedule.

Supplier processing identifies the sequential steps for fabrication, inspection, and test of product to be delivered. Suppliers typically develop processing in two steps. First, a sequential outline of major processing steps is prepared. It is this outline which is typically submitted to the Purchaser. Then detailed processing instructions are prepared for use by the supplier's crafts personnel in fabricating, inspecting, and testing the product.

Contracts typically require submittal of planning and

processing for information although sometimes contracts require Purchaser approval of these submittals. In either case, the Purchaser evaluates the submittals for (1) completeness, (2) consistency with contract technical, administrative, and schedular provisions, and (3) identification of Purchaser's notification points. At designated notification points, the supplier is required to provide a few days advance notification to the Purchaser of the specific time such points will be reached. In this manner, the Purchaser identifies early in the life of the contract those processing steps which will be witnessed or inspected by the Purchaser's designated representative.

Review of Supplier Documents

Contracts often require submittal of documents in addition to delivery of hardware. Examples of such documents include technical manuals, product drawings, engineering reports of analyses or tests, and supplier inspection and test reports. Procurement documents specify those supplier generated documents which must be submitted to the Purchaser. The Purchaser assures that measures are established for the control, handling, and approval of supplier generated documents.

Supplier generated documents typically have specific value to subsequent activities by the Purchaser. For example, technical manuals contain instructions for the storage, handling, installation and operation of product which are applicable to the Purchaser's use of the product. Supplier generated drawings provide product dimensions which must be known by the Purchaser to establish interfaces with other product. Accordingly, the Purchaser establishes measures for the acquisition, processing, and acceptance of supplier generated documents.

Measures established by the Purchaser assure that

suppliers provide required documents on time and that approval of these documents is recorded. Supplier submittals are monitored against the supplier's planning documentation for compliance with schedule. Purchaser's internal measures typically include a log of documents received and status of Purchaser's review and approval of the documents. These measures ensure that revisions to documents submitted by the supplier receive the same review and that approved revisions replace the previously submitted document.

Identification and Processing of Change Information

Changes to procurement documents are sometimes necessary after contract award. Design changes, approved changes requested by the supplier, and changes requested by the customer of the Purchaser are causes of changes. The Purchaser is responsible for initiating changes to the contract whenever approved changes to procurement documents affect the procurement action. This responsibility is carried out in conjunction with the Purchaser's document control system. That is, the Purchaser evaluates changes to documents for impact on procurements at the same time such changes are evaluated for acceptability.

Whenever changes to procurement documents affect the procurement, the approved change is issued to the supplier in the form of an amendment to the contract. Supplier acknowledgement of the contract amendment certifies supplier's understanding and commitment to the change. Dependent on the scope of the change, it may be necessary to adjust costs, schedule, supplier planning and processing, and Purchaser's notification points.

Exchange of Documents Method

The Purchaser establishes with the supplier the precise

method of exchange of documents during the life of the contract. The method includes identification of persons in each organization who serve as focal points for exchange of documents. In this manner a standard distribution list is established for each type of document. Persons designated to serve as focal points are in turn responsible for internal distribution within the organization. In addition to focal points, the method may also include special forms for transmittal of documents. Such forms are uniquely serialized and permit convenient tracking of and reference to specific documents.

PURCHASER VERIFICATION AND ACCEPTANCE OF SUPPLIER PRODUCT AND SERVICES

Scope

Purchaser evaluation of supplier performance, as previously described, evaluates overall supplier performance in terms of planning, scheduling, commitment of resources, and achievement of milestones to assure that these activities are accomplished in a satisfactory manner requires verification by the purchaser's quality representative.

Three methods of verifications are considered by the Purchaser: (1) surveillance, (2) inspection, and (3) audit. Surveillance and audit are performed at the supplier's facility. Inspection is performed at receiving or at the supplier's facility or both. Either surveillance or inspection at the supplier's facility typically involve notification points. These notification points are based on the Purchaser's plans for verification of supplier's products and services.

The extent of verification activities varies with product complexity and ability to accept the product upon receipt. Elements of the Purchasers verification activities are (1) source verification planning, (2) receiving inspec-

tion planning, (3) audit planning, (4) measuring and test equipment, (5) personnel qualifications and (6) reporting.

Source Verification Planning

Source verification planning identifies the inspections, tests, notification points, acceptance criteria and documentation to be used by the Purchaser to verify product and services at the supplier's facility. Procurement documents and supplier's planning and processing procedures are reviewed to determine those source verifications to be performed. Source verifications are typically planned whenever one or more of the following conditions occur:

- The product is vital to plant safety.
- Product quality characteristics are difficult or impossible to verify after delivery.
- Complex design, manufacture, or test activities are performed by the supplier.

Source verifications have the objectives of verifying that the supplier is properly performing fabrication, inspection, and test activities and confirming product acceptability by independent inspection. A large portion of source verification is addressed at the first objective, i.e., verifying supplier activities. By periodically verifying supplier activities, an assurance of product acceptability is obtained with minimal demand on the Purchaser's personnel resources. Where actual inspection of product is planned, the Purchaser has the option of witnessing the supplier's inspection and test or of performing independent inspection and test. In general, source verifications include verification that:

- Supplier generated documents are complete, reviewed, and approved as required.
- Fabrication procedures and processes are complied with.

- Applicable qualifications, records, and certifications are available, complete, and acceptable.
- Product is inspected and tested by the supplier as required and associated records are available, complete, and acceptable.
- Nonconformances are dispositioned in accordance with provisions of the contract.
- Product is cleaned, preserved, packed. and identified as required by procurement documents.
- Results of independent inspections and tests by the Purchaser's designated representative agree with results obtained by the supplier.

Receiving Inspection Planning

Receiving inspection planning identifies the characteristics to be verified and the supplier documentation to be reviewed upon receipt of items furnished by a supplier. Receipt inspections normally do not duplicate source verifications and the extent of receipt inspection varies with product complexity and importance to safety. In general, items are receipt inspected as a minimum, for (1) type, quantity, and identification, (2) evidence of no shipping damage, and (3) acceptability of accompanying test reports or certificates of compliance. Receiving inspection will be described fully in the next module of this course.

Audit Planning

Purchasers plan for audits of suppliers based on essentially the same criteria as for source verifications. However, regulatory commitments may require annual or triennial audits of suppliers of safety related components. In general, audits are focused toward those suppliers who continuously furnish products or whose products require more than a year to fabricate. Product acceptance by the

Purchaser is rarely based solely on audits of suppliers. Instead, audits augment the source verification or receiving inspection plans by critically evaluating the supplier's quality assurance program.

Measuring and Test Equipment

Measuring and test equipment used by the Purchaser's designated representative must be suitable and calibrated. Suitability refers to the capability and accuracy of the equipment, i.e., it must be capable of making the measurement or test required and its readout must be of an accuracy finer than the tolerance of the measured feature. Normally, accuracy of 25% or less of the tolerance is required. Calibration refers to the ability to trace the equipment's accuracy to a national standard or to a recognized physical constant.

Measuring and test equipment used for performing source verifications are typically provided by the supplier. In such cases, it is incumbent on the Purchaser's designated representative to verify that such equipment is suitable and calibrated within the supplier's calibration program. Measuring and test equipment used for receiving inspection are typically owned, selected, and calibrated by the Purchaser. In the event measuring and test equipment is found to be out of calibration, the Purchaser evaluates the validity of previous inspections or tests by the designated representative with that equipment. The evaluation considers the extent of inaccuracy of the equipment, and the tolerance of measured features, and determines if inspections or tests must be repeated. The results of the evaluation are documented.

Personnel Qualifications

Persons who perform source evaluations, verifications and receiving inspections for the Purchaser are qualified as required

by applicable codes and standards. The Purchaser, or an agent thereof, certifies personnel qualification based on individuals' training, experience, and scores on qualification examinations.

Reporting

Performance of verification activities is reported in all instances. Reports are initiated for source verifications, receiving inspections, and audits. In addition, Purchaser's actions with respect to nonconformances, dispositions, waivers, and corrective action are documented.

CONTROL OF NONCONFORMANCES

Scope

The Purchaser and supplier establish and document measures for the identification, control, and disposition of items and services that do not meet requirements of procurement documents. Supplier responsibility for control of nonconformances and measures for Purchaser's actions on nonconformances are specified within provisions of the contract. The Purchaser verifies compliance with such contractual provisions.

Provisions

Provisions for the supplier's control of nonconformances require the supplier to implement a documented procedure for identification, control, and disposition of nonconformances. Identification includes tagging, labeling, or marking of the nonconforming item and the initiation of a nonconformance report which describes the nonconformance. Control measures are procedural requirements which prohibit use of the nonconforming item prior to disposition of the nonconformance. Disposition involves evaluation by the

supplier and, in certain cases, approval by the Purchaser. Disposition options are scrap and replace, rework, repair, and accept "as-is".

The supplier's documented procedure assigns responsibilities for dispositioning nonconformances. Typically, engineering and quality assurance departments are responsible. The disposition selected is based on whether the nonconformance or rework or repair thereof affects fit, function, or interchangeability. If these factors are unaffected, accept as-is may be appropriate. Rework or repair dispositions are appropriate if such rework or repair restores the item to a conforming or acceptable status respectively. Scrap and replace is appropriate when repair is impracticable. The Purchaser is responsible for verifying that suppliers' control of nonconformances results in acceptable product or services. To facilitate this verification, contractual provisions require the supplier to obtain Purchaser approval of dispositions prior to their implementation. Typically, Purchaser approval of the supplier's disposition of nonconformances is required whenever any of the following occur:

- violation of technical or material requirement of procurement documents.
- violation of a supplier document which was approved by the Purchaser.
- disposition by repair.
- inability to conform with the original requirement even though rework or repair restores functionability.

The Purchaser acts on supplier nonconformance reports in accordance with a documented procedure. This procedure assigns responsibilities for review and disposition of the supplier's recommendations, verification of supplier's implementation of Purchaser's disposition, and maintenance of records of supplier nonconformances. The flow of these activities are illustrated in Figure 31-2-2.

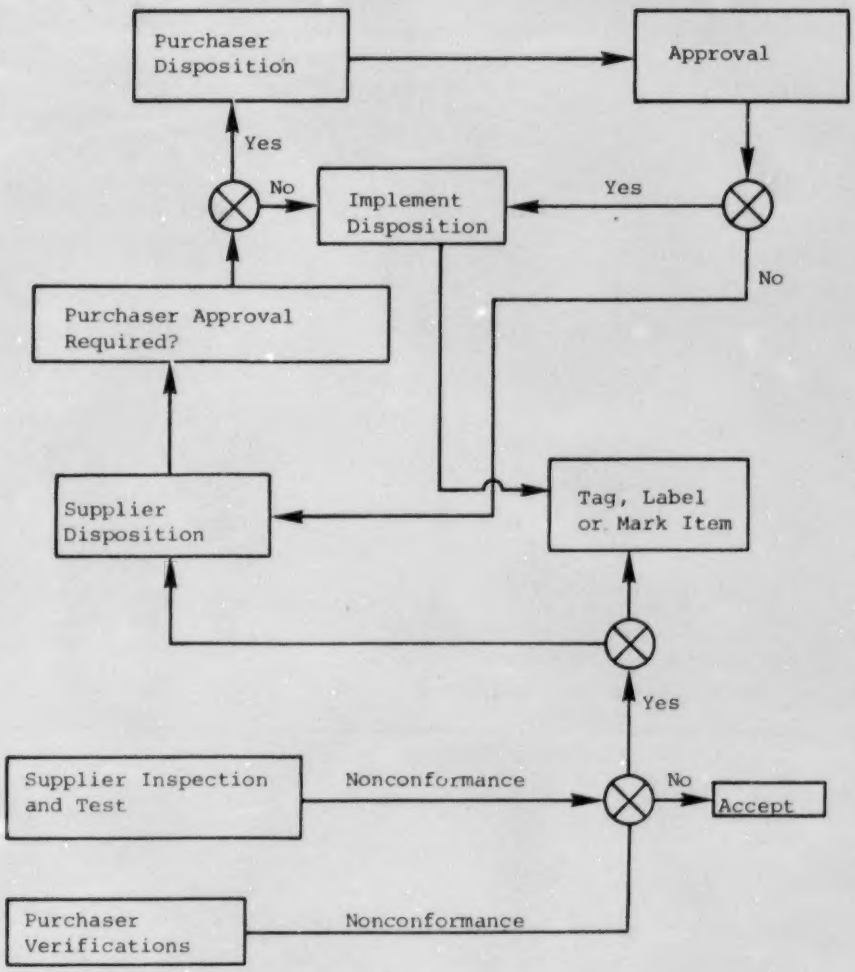

Figure 31-2-2. Disposition of Nonconformances

CORRECTIVE ACTION

Scope

The Purchaser and the supplier are responsible for establishing documented measures for providing timely corrective action on conditions adverse to quality. The

supplier's corrective action applies to adverse conditions which are the responsibility of the supplier. Likewise, the Purchaser's corrective action applies to adverse conditions which are the responsibility of the Purchaser. In addition, the Purchaser is responsible for verifying that the supplier implements a corrective action system.

Provisions

Significant conditions adverse to quality are eliminated by the process of corrective action. This process includes (1) identification of deviations and nonconformances, (2) review and evaluation of the conditions which caused such deviations and nonconformances, (3) corrective action to eliminate significant conditions which cause deviations and nonconformances, (4) report of such actions to management, and (5) follow-up to verify implementation of corrective action. The Purchaser's and supplier's corrective action systems assign responsibilities for identification of deviations and nonconformances and for evaluating conditions to determine the need for corrective action beyond correcting the specific deviation or nonconformance.

Identification of deviations and nonconformances is a function of inspection, test, surveillance, and audit. Individuals performing these activities issue reports which document the activity and identify any deviations and nonconformances. To facilitate disposition of deviations and nonconformances, a separate report is typically issued. Evaluation of these reports for significant adverse conditions may be the responsibility of the affected department or of a centralized group such as quality assurance department.

PURCHASER'S ACCEPTANCE OF ITEM OR SERVICE

Scope

The Purchaser establishes a method of acceptance of items or services furnished by suppliers. While the supplier is responsible for furnishing items and services in compliance with procurement documents, the Purchaser determines acceptability of items and services at the point in time where ownship of the product transfers to the Purchaser. Once accepted, the product belongs to the Purchaser. Any subsequent problems with the product typically represent supplier responsibility only as provided by warranty. Purchaser acceptance is based on one or more of the following:

- Acceptance of certificate of conformance
- Acceptance by source verification
- Acceptance by receiving inspection
- Acceptance by post installation test
- Acceptance by evaluation of service.

Procurement documents specify the point of acceptance. The Purchaser's programs for evaluation of supplier performance, verification of items and services, control of nonconformances, and corrective action are planned in such a manner as to provide the basis for acceptance at the designated point.

Acceptance by Certificate of Conformance

Purchaser's acceptance of product or services based solely on supplier's certificate of conformance involves the least evaluation and verification by the Purchaser. This method is acceptable when not prohibited by regulations, codes and standards and when the item or service is of simple design and involves standard materials, processes and test. Where acceptance is by certificate of compliance, the Purchaser establishes the following contractual provisions

to govern the supplier's submittal of the certificate:

- Identification of purchased items.
- Identification of codes, standards, specifications, and drawings met by the purchased items including identification of approved changes, waivers, or deviations.
- Identification of nonconformances, if any, and disposition of each.
- Signature of supplier individual designated as responsible by the supplier's quality assurance program to attest to the accuracy and completeness of the certificate.
- Description of the certification system in the supplier's quality assurance program.

Certificates of Conformance submitted in accordance with contractual provisions are reviewed by the Purchaser for acceptance. The Purchaser also reviews supplementary data reports as may be required by procurement documents to accompany the certificate. Examples of data reports are material test reports, inspection records, and test reports which identify quantitative and/or qualitative data. If the certificate is verified as in compliance with contractual provisions, the corresponding items or services are accepted.

Purchasers also establish means of periodically verifying the validity of suppliers' certificates of conformance. Such verifications may include periodic audits of the supplier or independent inspection and test of a sample of the items. The interval of conducting these verifications is periodically adjusted to be commensurate with the supplier's quality history.

Acceptance by Source Verification

Purchaser acceptance of items and services by source verifications typically applies when the item or service

is (1) vital to plant safety, or (2) difficult to verify quality characteristics after delivery, or (3) complex in design, manufacture, and test. Prior to delivery of such items, the Purchaser's designated representative verifies that source verification of acceptability has been completed and that deviations and nonconformances have been properly resolved. Upon completion of this verification, the designated representative reports to the Purchaser the satsifactory completion of source verification activities. Based upon this report, the Purchaser accepts the item, authorizes delivery, and notifies the point of receipt of acceptability of the item.

Acceptance by Receiving Inspection

Purchaser acceptance solely by receiving inspection applies when the item or service is (1) relatively simple and standard in design, manufacture, and test, (2) adaptable to standard inspections and/or tests after delivery, and (3) do not require inspections or tests which would adversely affect the integrity, function, or cleanness of the item. In addition to acceptance solely by receipt inspection, those items subject to source verifications may also be accepted at receiving inspection In such cases, the designated representative reports accomplishment of source verifications but acceptance is delayed until accomplishment of receiving inspection.

Acceptance by Post Installation Test

Purchaser acceptance by post installation test is always preceded by source verification, receiving inspection, or supplier certificate of compliance. This acceptance method applies with (1) it is difficult to verify quality characteristics of the item unless it is installed and in use, or (2) the item requires integrated check out or test

with other items, or (3) the item cannot demonstrate its ability to perform its intended function except when in use. Examples of such items are fuel cells and steam generators. The post installation test requirements and acceptance criteria are mutually established between the Purchaser and the supplier.

Acceptance of Services

The previous methods of acceptance primarily apply to Purchaser's acceptance of hardware items and associated services. However, some procurements are for services only. Examples include third party inspection, engineering and consulting services, and installation, repair, overhaul, or maintenance work. Acceptance of services only is based on one or more of (1) technical verification of data produced, (2) surveillance and/or audit of the activity, and (3) review of supplier's reports such as certifications and analysis reports.

QUALITY ASSURANCE RECORDS

Scope

The Purchaser is responsible for establishing internal measures for the control of Purchaser generated QA records and for specifying within procurement documents the supplier responsibilities for supplier generated QA records. In addition, the Purchaser's procurement documents specify those supplier generated QA records which are required to be submitted to the Purchaser. Typical records with respect to Purchaser's qualification, evaluation, and verification of suppliers and those submitted by the supplier to the Purchaser are listed in Table 31-2-1.

Table 31-2-1

TYPICAL PROCUREMENT QUALITY ASSURANCE RECORDS			
Purchaser Generated Records			Supplier Generated Records
Supplier Qualification	Evaluation of Supplier	Verification of Items	
Prior receipt inspection results	Procurement document and changes thereto	Source verification records	Planning
Prior source verification results	Reports of meetings	Receiving inspection records	Processing
Prior QA audits	Approvals of supplier submittals	QA audit records	Nonconformance reports
Other users reports		Installation inspection and test records	Inspection records
Supplier QA manual		Product performance records	Test records
Supplier QA procedures			Certificates of compliance
Product failure reports			
On-site direct evaluation reports			

Provisions

Supplier generated QA records are either retained by the supplier or submitted to the Purchaser as specified by procurement documents. For those retained by the supplier, the procurement documents specify requirements for storage conditions, retrievability and retention time. Those forwarded to the Purchaser become the Purchaser's responsibility and are placed within the Purchaser's records management system. The Purchaser's system also includes defined requirements of storage, retrieval, and retention.

Regulatory requirements and provisions of codes and standards stipulate criteria for records management. In general, the criteria require retention of records which characterize the design, processing techniques, as-built condition, and function of the item or service. For each record to be retained, a retention period is assigned based on the stipulated criteria. Retention periods range from one year to end of service to life of product. Retrievability requirements are stated as "retrievable without undue delay".

AUDIT OF PROCUREMENT PROGRAM

Scope

The Purchaser's program of internal audits must include audit of the Purchaser's procurement program. The internal audit serves to evaluate the effectiveness of and compliance with the Purchaser's documented measures for preaward and postaward activities. In addition, the Purchaser's program of external audits schedules and performs audits of suppliers as considered necessary.

Provisions

Internal audits of the procurement program are scheduled and performed by the same procedures as govern internal audits of other QA programs. Typically, these audits are performed annually. External audits of suppliers are typically performed either (1) once during the life of the contract, (2) annually, or (3) triennially when annual evaluations do not indicate the need for more frequent auditing.

All audits are performed in accordance with a documented program. The program provides for the preparation, performance, reporting, and follow-up of each audit. Preparation involves selection of lead auditor and audit team members, the development of a written plan or check list for performing the audit, and arrangements with the organization to be audited. Performance involves preaudit conference, evaluation of objective evidence of quality, and postaudit conference. Reporting involves preparation of an audit report and transmittal of the report to appropriate management levels. Follow-up involves obtaining corrective action response on audit findings and verification of implementation of such corrective actions.

EXERCISES

The following exercises serve to reinforce the concepts presented in this module.

1. Obtain a marketing brochure from a local company and evaluate it to determine if the company could be considered as a qualified supplier. Use the checklist given in the Procedures given in this module to perform this evaluation.

2. Obtain from your instructor a copy of a company's quality assurance procedure for control of procurement of items and services. Using the Procedures given in this module evaluate this QA procedure.

3. Describe the purchaser's program for the selection of procurement sources including the methods of:
   a. quality history
   b. current quality information
   c. on-site review

4. Explain briefly the purpose of a bidders test.

5. Briefly explain the purpose of bid evaluation applicable to:
   a. technical considerations
   b. quality assurance
   c. supplier personnel
   d. supplier production capacity
   e. exceptions

6. What are four methods of Purchaser's acceptance of items or services furnished by suppliers?

7. Answer the following questions as either true or false:

____ a. Qualified suppliers are those who are considered by the Purchaser as capable of satisfactorily providing products or services.

____ b. The process of determining qualification of suppliers is termed selection of procurement sources which has the purpose of predetermining those suppliers who are deemed by the Purchaser as having the capability to furnish quality products or services on time at competitive prices.

____ c. Selection of procurement sources establishes a bidders list which provides a convenient listing of qualified suppliers from which bids are solicited whenever the need arises for a procurement action. Suppliers are categorized on bidders lists by types of items and services for which they are considered qualified.

____ d. Evaluation methods used for selection of procurement sources include one or more of (1) evaluation of historical records of performance on same or similar items or services, (2) evaluation of current quality information furnished by the supplier, and (3) evaluation of supplier's capabilities by on-site reviews. Bid evaluation and award results in placement of a contract with the successful bidder.

____ e. Evaluation of bids include assessment of (1) technical considerations, (2) quality assurance, (3) research and development effort, (4) supplier's personnel, (5) supplier's production capability, (6) supplier's past performance, (7) alternates, and (8) exceptions.

____ f. Prior to award of the contract to the supplier who submitted the "Lowest" bid, the Purchaser obtains supplier resolution or commitment for resolution of unacceptable conditions, if any, noted by bid evaluation.

____ g. Notification points are those steps within supplier's processing at which the Purchaser requests notification prior to the supplier performing the step. Notification points are useful in assuring accomplishment of planned source verifications.

____ h. Purchaser's verification of supplier's items or services include the (1) product inspection planning, (2) shipping inspection planning, (3) postaward planning, (4) research equipment, (5) personnel qualifications, and (6) vendor qualification.

____ i. The Purchaser verifies supplier control of nonconformances by exercising approval authority over disposition of nonconformances and by source verifications or audits.

____ j. The supplier designates in procurement documents the point of acceptance and the acceptance criteria for items and services furnished by the purchaser.

____ k. The Purchaser method of acceptance of supplier's items or services is based on the complexity of the item or service and its importance to plant safety. Methods of acceptance are (1) acceptance by certificate of conformance, (2) acceptance by source verification, (3) acceptance by receiving inspection, (4) acceptance by post installation test, and (5) acceptance of services.

MATERIALS

The following materials are required to support this module.

1. Marketing brochures from various companies.
2. Copies of various companies' quality assurance procedures on control of procurement of items and services.

PROCEDURES

The following procedures refer to exercises 1 and 2 presented in this module.

1. Obtain a marketing brochure from a local company and evaluate it to determine if the company could be considered a qualified supplier. Use the following check list for the evaluation and identify types of information which are needed but not provided by the brochure:
   a. name of supplier
   b. item or service furnished by supplier
   c. codes, standards, or specifications met by item or service
   d. prior users of the product or service
   e. inspection or test data which attests to performance of the item or quality of the service
   f. warranties
   g. supplier's quality assurance program
   h. supplier's organization and staffing
   i. supplier's manufacturing, inspection, and test facilities
   j. supplier's control of subtier suppliers.

2. Obtain from the instructor a copy of a company's quality assurance procedure for control of procurement of items and services. Evaluate the procedure against the content of this module. Identify omissions and offer rationale for each ommission. Identify noteworthy strengths and state why you considered it noteworthy. To assist you in your evaluation, the following items may be considered:
   a. acceptance of certificate of conformance
   b. acceptance by source verification
   c. acceptance by receiving inspection
   d. acceptance by post installation test
   e. acceptance by evaluation of service

DATA TABLE

Not Applicable.

REFERENCE MATERIALS

NRC, Regulatory Guide 1.123, Quality Assurance Requirements for Procurement of Items and Services for Nuclear Power Plants, U.S. Nuclear Regulatory Commission, 1977

NRC, Regulatory Guide 1.144, Auditing of Quality Assurance Programs for Nuclear Power Plants, U.S. Nuclear Regulatory Commission, 1979

ASME, Quality Assurance Requirements for Control of Procurement of Items and Services for Nuclear Power Plants, ANSI N45.2.13, The American Society of Mechanical Engineers, 1976

ASME, Requirements for Auditing of Quality Assurance Programs for Nuclear Power Plants, ANSI N45.2.12, The American Society of Mechanical Engineers, 1977

Juran, J.M., Quality Control Handbook, McGraw-Hill, 1974

TEST

1. Define:
   a. Procurement Document

   b. Purchaser

   c. Right of access

   d. Supplier

2. State the purpose of selection of procurement sources.

3. Describe a bidders list including its purpose and use.

4. Describe the supplier selection process of evaluation of historical records of performance.

5. Describe the supplier selection process of evaluation of current quality information furnished by the supplier.

6. Describe the supplier selection process of evaluation by on-site review.

7. Briefly describe a Purchaser's actions in soliciting bids by formal inquiry.

8. State the purpose of each of the following subjects of bid evaluation:
   a. technical considerations

   b. quality assurance

   c. research and development effort

   d. supplier personnel

   e. supplier's production capability

   f. supplier's past performance

   g. alternates

   h. exception

9. State the overall purpose of purchaser's postaward activities.

10. Name five activities of the Purchaser used for evaluating supplier performance and describe the role of each.

a.

b.

c.

d.

e.

11 State the purpose of purchaser's notification points.

12. Briefly describe how notification points are established.

13. Name six elements of Purchaser's verification activities and briefly describe the role of each:

a.

b.

c.

d.

e.

f.

14. Describe the Purchaser's responsibilities with respect to nonconformances in suppliers' products or services.

15. Name five methods of Purchaser's acceptance of supplier's product or service and briefly describe how each is accomplished.

a.

b.

c.

d.

e.